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Four hundred and sixty-ninth meeting.

September 13, 1859. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read a letter from M. Liouville, of Paris, in acknowledgment of the notice of his election as a Foreign Honorary Member. Also various letters relating to the exchanges of the Academy.

Professor Peirce made a communication upon some of the laws of Astronomical Cosmology.

Professor Horsford gave an account of the so-called sap-sand found in maple sugar, which he had ascertained to be a neutral tartrate of lime.

Dr. B. A. Gould, Jr. laid before the Academy a circular from a committee of the American Association for the Advancement of Science, addressed to the friends of Astronomy, being an appeal in behalf of a new attempt to determine the solar parallax.

Dr. Beck mentioned, that while on his late tour in Europe, being in search of manuscripts of the *Satyricon* of Petronius Arbiter, he found, in the Bibliotheca Ricardiana at Florence, and the Bibliotheca Vaticana at Rome, two small manuscripts of grammatical or bibliographical contents, which he believes have not yet been published. Both manuscripts bear the name Petronius Arbiter, the Vatican manuscript with the addition, " de antiquis dictionibus." The relation of this fragment to A. Gellius, Nonius, and other authors of this class, and the question whether the author has borrowed from them or from common sources, are of some interest. The fragment, although not of great importance, is of sufficient interest to justify its publication. Dr. Beck hopes to be able, from the two manuscripts and other means, to construct, with one or two exceptions, a reliable text, which he intends to append to the result of his inquiries concerning the text and manuscripts of the *Satyricon*, which he is now engaged in preparing.

Professor Gray presented the following paper: —

Notes upon some Rubiaceæ, collected in the South Sea Exploring Expedition under Captain Wilkes. By Asa Gray, M. D. (Continued from April, 1858: *vide* p. 50.)

Coprosma calycina: herbacea, repens, fere glabra; foliis ovato-rotundis ciliolatis breviter petiolatis; stipulis obsoletis; floribus subsolitariis subsessilibus 4–5-meris; calycis lobis ovato-lanceolatis foliaceis ovario obovato æquilongis corolla tubulosa vix dimidio brevioribus. Hedyotis repens, *Clos in Gay, Fl.* 3, *p.* 208. — Chili, common in the province of Valdivia, &c., *C. Gay.* — It is odd that this plant, having been correctly described, except that the dry drupe is called a capsule, should yet have been mistaken for a *Hedyotis.* It really forms a connecting link between *Nertera* (of which it has the habit) and *Coprosma;* but is peculiar for its large calyx-lobes, which persist on the young fruit. According to Clos, it is monœcious or diœcious, which, with the developed lobes of the calyx, would fix the plant in *Coprosma.* But the only flower upon my specimen is hermaphrodite!

7. *Corrections and Additions to the former article.*

Psychotria parvula, p. 13, is only a form of *P. serpens,* Linn., as appears upon a comparison with specimens from Hong Kong, and from the Loo Choo and Bonin Islands.

P. turbinata, p. 12. — Mr. Bentham has distributed No. 2086 of Spruce's Amazon collection under the same name; but as the flowers of that plant seem equally to be unknown, it may be best to retain the name for the Feejean species, which can hardly be any else than a *Psychotria.*

Among some Polynesian *Rubiaceæ,* collected by Mr. Milne in the recent cruises of the Herald, British surveying vessel, and placed in my hands by Dr. Hooker, I notice two species which may be referred to the genus *Calycosia,* p. 15, although their flowers are in loose cymes: —

Calycosia pubiflora (sp. nov.): foliis membranaceis glabris oblongo-lanceolatis acuminatis in petiolum attenuatis (4 – 6-poll. longis); cyma laxa trichotoma calycisque tubo viscoso-pubescentibus, limbo crateriformi extus puberulo; drupa turbinata, pyrenis chartaceis intus excavatis. — Viti-levu, Feejee Islands, *Mr. Milne.* — Limb of the calyx apparently white, half an inch in diameter. Corolla hardly exserted.

CALYCOSIA MILNEI (sp. nov.): glaberrima; foliis oblongis sublanceolatisve basi attenuatis longiuscule petiolatis punctulatis (3 – 4-pollic.); cyma diffusa repetito-trichotoma; pedicellis gracilibus. — "Anuteum [Feejee Islands?], Nov. 1853, a slender shrub, frequent on high grounds," *Mr. Milne.*

8. *Scyphiophora.*

Epithinia of Jack has been identified by Korthals with the little-known *Scyphiophora* of the younger Gærtner. Jack's description appears to be perfectly correct, so far as it goes (except as to the absence of stipules). But — as respects the various subsequent attempts to complete the generic character — it may be noted that the upper ovule is not pendulous from the apex of the cell, as stated by Wight and Arnott; nor are the ovules solitary in each cell, as stated by Hasskarl; nor is the upper ovule prematurely abortive, as Miquel describes it. The two long and narrow cells of the ovary each contain a pair of anatropous ovules, borne on slender funiculi, which are inserted on the dissepiment at the middle of the cell; the upper one is erect, the lower one pendulous. The funiculi are more or less thickened at their apex, so as to cap the base of the ovule, as in the *Guettardeæ* generally. Not rarely all four ovules are fertilized. In the fruit each cell becomes constricted between the seeds into two imperfect *locelli*, one above the other. The seeds are conformed to the cavity, and are somewhat curved. In those examined, which were not perfectly mature, the albumen was almost wanting; the cotyledons oblong, flattish, and longer than the radicle. The putamen does not readily separate into two pyrenæ. The corolla is contorted in æstivation, and sometimes pentamerous. The genus should perhaps be appended to the *Guettardeæ.*

9. *Bikkia.*

Bikkia grandiflora, Reinw., or *B. australis,* DC., or more properly *B. tetrandra* (*Portlandia tetrandra* of Forster), was collected at the Friendly Islands, in fine specimens, by Professor Harvey. The corolla is valvate in æstivation, as in *Portlandia,* but strongly reduplicate, so that the summit of the flower-bud is cruciately four-angled or winged. Stigma bilamellar; the lobes short, oblong, and thickish. Ovules oblong, horizontal. Testa of the immature seeds conformed to the nucleus.

10. *Cinchoneæ.*

The following are two new genera of this subtribe in the collection of the South Sea Exploring Expedition; one of them founded upon Forster's *Cinchona corymbifera*, the other upon new discoveries.

BADUSA, Nov. Gen.

Calyx tubo clavato; limbo brevi cupulato 5-dentato persistente. Corolla hypocraterimorpha, glabra, 5-fida; limbo tubum adæquante, lobis lineari-oblongis æstivatione contorto-imbricatis (uno exteriore), explicatis patenti-recurvis. Stamina 5, exserta: filamenta filiformia, imæ basi corollæ inserta, inferne villosa; antheræ lineares, dorso supra basim affixæ, mox versatiles. Stylus filiformis, ramis 2 brevibus cum stigmatibus subcapitatis intus planis in clavellam angulatam conglutinatis. Ovarium biloculare. Ovula in placentis lineari-oblongis crassis plurima, anatropa, sese imbricantia, superiora adscendentia, inferiora pendula. Capsula clavato-oblonga, cartilaginea, bilocularis, polysperma, ab apice ad basim septicida. Semina ovalia, modice alata. Embryo rectus albumine carnoso paullo brevior; radicula tereti cotyledonibus ovatis longiore. Frutices sempervirentes? Oceanici, glabri; stipulis brevibus vaginatis; pedunculis axillaribus apice foliatis cymoso-plurifloris; floribus albis.

BADUSA CORYMBIFERA. Cinchona corymbifera, *Forst.* C. Philippica, Cav.? Exostemma, *R. & S.* — Distinguished from *Exostema* by the æstivation, the versatile anthers, and the inflorescence.

DOLICHOLOBIUM, Nov. Gen.

Calyx tubo cylindrico elongato; limbo amplo submembranaceo cyathiformi truncato integerrimo (rariusve sublobato) persistente. Corolla hypocraterimorpha; limbo 4 – 5-partito, lobis oblongis obtusissimis plurinerviis æstivatione contortis. Stamina 4 – 5, tubo infra faucem inserta, glabra, inclusa: filamenta brevissima: antheræ lineares, basifixæ, introrsum adnatæ. Stylus bifidus, ramis subspathulatis sursum petaloideo-dilatatis intus secus costam stigmatosis. Ovarium biloculare. Ovula in placentis elongatis crassis numerosissima, minuta, sursum imbricata, acicularia. Capsula siliquæformis, teretia, longissima (4 – 6-pollicaris), calycis limbo crateriformi seu pateriformi (fructu multoties latiori) plerumque coronata, demum septicida? Semina creberrima, nucleo ovali, ala angusta utrinque in caudam simplicem longissimam sensim attenuata. Embryo in albumine parco carnoso rectus; cotyle-

donibus ovatis radicula infera parum brevioribus. — Frutices Vitienses; foliis membranaceis petiolatis recte penninerviis, venulis pulchre reticulatis; stipulis interpetiolaribus membranaceo-foliaceis distinctis obtusis planis plerumque caducis; pedunculis brevibus ex axillis superioribus tri-paucifloris; floribus majusculis; tubo calycis et corollæ (albæ?) extus pube appressa indutis. — Genus *Cosmibuenæ* affine.

DOLICHOLOBIUM OBLONGIFOLIUM (*Gray, l. c.*): foliis oblongis seu elongato-oblongis utrinque acutiusculis (2½–5 poll. longis); flore pentamero. — Collected at Sandal-wood Bay, Vanua-levu, one of the Feejee Islands, in fruit, in the Pacific Exploring Expedition; afterwards, in blossom, by Mr. Milne, which afforded the materials required for characterizing the genus.

DOLICHOLOBIUM LATIFOLIUM (*Gray, l. c.*): foliis latissime obovatis basi rotundatis vel obtusissimis (5–7 poll. longis); flore tetramero, an semper? — Ovolau, Feejee Islands.

Coutarea of Aublet has the æstivation of the corolla *imbricative* (with the tube somewhat plaited), not induplicate, as stated by Endlicher, who thus led Weddell to rank the genus among those with valvular or modified valvular æstivation. Endlicher has omitted to mention that the corolla is curved or unequally ventricose in the bud. In *C. Mexicana* the flowers are, at least sometimes, pentamerous.

11. *Randieæ*.

From the South Sea Islands we have three species of *Stylocoryne*, viz.: —

STYLOCORYNE SAMBUCINA, which must take this name because it is, as I suppose, Forster's *Coffea sambucina*, although one form of it is certainly Bentham's *Stylocoryne pepericarpa*.

STYLOCORYNE COFFÆOIDES, which I take for Forster's *Coffea odorata*. It is the *Stylocoryne racemosa* of Hooker and Arnott in Beechey's voyage (from Tahiti), but not, I suppose, of Cavanilles (from Manilla), in which the calyx is described and figured as pretty strongly 5-toothed, while in this the limb is truncate and barely denticulate.

STYLOCORYNE HARVEYI (*Gray, l. c.*): glaberrima; foliis chartaceis oblongis acuminatis basi in petiolum longiusculum contractis; cymis axillaribus terminalibusque petiolum vix superantibus subsessilibus; calycis limbo quadrifido, lobis triangulari-subulatis tubo vix brevioribus; corollæ lobis 4 lineari-oblongis tubo longioribus, fauce imberbi. Aff. præcedenti. — Feejee Islands, Prof. Harvey.

GOULDIA, Nov. Gen.

Calyx tubo obovato vel turbinato; limbo brevi quadrifido. Corolla hypocraterimorpha, subcoriacea, undique glabra; limbo quadripartito, lobis æstivatione valvatis. Stamina 4, fauci corollæ inserta: filamenta brevissima: antheræ inclusæ, oblongo-lineares, acutæ. Stylus gracilis, apice bifidus: stigmata filiformia, acuta, in una specie crassiora. Ovarium biloculare. Ovula in placentis crassis, medio dissepimento utrinque insertis, plurima, parva, amphitropa. Bacca drupacea bilocularis, endocarpio pergameno; placentis spongioso-carnosis alveolatis oligo-pleiospermis. Semina angulata vel complanata, peltata, nunc in alveolis placentæ subimmersa: testa nucleo conformis, tenui-crustacea, pellicula papuloso-reticulata. Embryo intra albumen subcartilagineum rectus; cotyledonibus ovatis parvis radicula vix brevioribus. — Frutices vel arbusculæ insularum; foliis oblongis brevi-petiolatis; stipulis brevibus utrinque integris subvaginatis; floribus viridulis albidisve cymosis vel subsolitariis.

GOULDIA SANDWICENSIS. Kadua affinis, *Cham. & Schlecht.* Var. TERMINALIS. Petesia? terminalis, *Hook. & Arn.* Var. CORIACEA. Petesia? coriacea, *Hook. & Arn.* Var. HIRTELLA. — A polymorphous species.

GOULDIA ROMANZOFFIENSIS. Kadua Romanzoffiensis, *Cham. & Schlecht.* Petesia carnosa, *Hook. & Arn.*

I have much pleasure in dedicating this genus to Augustus A. Gould, M. D., a distinguished zoölogist, author of the Natural History of the Invertebrata of Massachusetts, and of the Conchology of the South Sea Exploring Expedition under Captain Wilkes. These species were taken for congeners by Chamisso and Schlechtendal, who included them in their genus *Kadua,* and afterwards, quite independently, by Hooker and Arnott, who referred them to the much-vexed or factitious genus *Petesia.* On the whole, they appear to be properly associated, although the differences between them are not unimportant. *G. Sandwicensis* is more related to *Stylocoryne. G. Romanzoffiensis,* with its distinctly vaginate, though very short, and conpetiolar stipules, and with the large, pyriform, whitish, drupaceous berry opening at maturity at the naked apex by a round hole or short chink, through which it may discharge the seeds, is really allied to *Kadua.* But besides the truly baccate or drupaceous fruit, with the limb of the calyx obliterated, the few and peltate seeds are quite different. On

the other hand, the æstivation of the corolla and the bifid style perfectly distinguish this genus from *Stylocoryne*, as does the former character from *Fernelia*. As to *Petesia*, that genus is known to have been founded upon species of *Rondeletia*, to which the wholly obscure species added by Jacquin is thought to belong; the *P. spicata* of Swartz is probably *Gonzalea spicata;* Gærtner's *P. carnea*, on which De Candolle founded his dubious genus *Eumachia*, is perhaps an *Ixora;* and finally the Philippine and Mexican species proposed by Bartling, and adopted by De Candolle, are still obscure, and perhaps themselves heterogeneous. There is small likelihood that any of them are congeners of the species here characterized.

12. *Rondeletieæ.*

LERCHEA CALYCINA (*Gray, l. c.*): foliis oblongo-lanceolatis acuminatis basi attenuatis, junioribus (præsertim costis venisque subtus cum stipulis integerrimis ovato-lanceolatis caudato-acuminatis ramulis floribusque) ferrugineo-sericeis; cymis condensatis; lobis calycis lineari-spathulatis foliaceis tubo corollæ parum brevioribus. — Ovolau, Feejee Islands, in fruit only; Viti-levu, Mr. Milne (in herb. Hook.), with blossoms.

This is evidently a near relative of Reinwardt's *Xanthophytum fruticulosum.* Indeed, should Blume's character, *stipulæ geminata, magnæ, bifidæ*, be incorrect, nothing of consequence would remain in the description to distinguish that plant from the present. But Mr. Bennett's remark (in Pl. Jav. Rar., p. 101) implies that the æstivation of the corolla in the original *Xanthophytum* is imbricative (or rather convolutive), as in *Wendlandia.* In the present plant it is certainly valvular. So that, whether *X. fruticulosum* is to fall into *Lerchea* or not, our present plant must do so, although the enlarged and foliaceous calyx-lobes seem to be peculiar. The stigma is that of *Xanthophytum.* The cocci are at length ventrally dehiscent and similar to those of the subgenus *Diplophragma* of *Hedyotis;* from which the large epigynous disk and the interpetiolar stipules mainly separate it.

The species of *Ophiorhiza* are by no means well characterized. Of the three here proposed, the first is the most peculiar; the second and the third are perhaps confluent.

OPHIORHIZA PEPLOIDES (*Gray, l. c.*): herbacea, pumila, diffuse ramosa; ramis puberulis foliosis; foliis parvis sæpe 3 – 5-natis vel pseudo-verticillatis spathulatis seu ovato-spathulatis basi longe attenuatis glabris; floribus subsolitariis glabris; filamentis filiformibus styloque exsertis. — Feejee Islands; also collected by Mr. Milne, and a smaller-leaved form by Prof. Harvey. The leaves resemble those of *Peplis Portula.*

OPHIORHIZA LEPTANTHA (sp. nov.): fruticosa, fere glabra; foliis lætevirentibus oblongo- seu elongato-lanceolatis utrinque acuminatis longe petiolatis; stipulis utrinque binis setaceis; cyma multiflora puberula; floribus plerisque secundis subsessilibus; corolla alba gracili pollicari, ore tenuissime barbato; staminibus inclusis; filamentis anthera æquilongis; stylo glabro. — Feejee Islands: also collected by Prof. Harvey.

OPHIORHIZA LAXA (sp. nov.): fruticosa; ramis junioribus sæpe ferrugineo-puberulis; foliis oblongis vel subovatis acuminatis longe petiolatis; cymis pauci-plurifloris laxis; floribus pedicellatis; corolla semipollicari; cæt. fere præcedentis, sed ramosior laxior. — Feejee Islands: also gathered by Mr. Milne.

13. *Hedyoteæ.*

Oldenlandia, Houstonia, Hedyotis, etc. It is unnecessary to recapitulate the history of the ancient genera *Oldenlandia* (1703), *Houstonia* (1737), and *Hedyotis* (1747), previous to the consummation of their union by Wight and Arnott into one polymorphous, or, as they justly term it, compound genus, for which, following Lamarck, the latest of the three names was adopted. Korthals has since proposed the establishment, or re-establishment, of all Wight and Arnott's principal sections as distinct genera. Bentham, taking an intermediate view, and depending mainly upon dehiscence, adopts two of the Linnæan genera, viz. *Hedyotis* (to which he refers *Dimetia* as well as *Macrandia* and *Diplophragma*) and *Oldenlandia* (to include *Houstonia, Anotis,* &c.), and also admits *Scleromitrion* and *Kohautia.* I had adopted Bentham's view, without particular investigation. But I now come to the conclusion, that all three Linnæan genera equally merit restoration, or at least that *Houstonia* is more definitely distinguishable from *Oldenlandia* than it is from *Hedyotis,* as the latter is received by Bentham. For the *Dimetiæ* and *Macrandriæ* generally, and many of the *Diplophragmæ,* not only accord with *Anotis* in habit, in flowers, and in the structure of the seed, but also in the dehiscence, which is loculicidal across the vertex of the capsule in the first instance; and although at length the fruit may readily split septicidally, even into two cocci, so it does in various *Houstoniæ* or *Anotides,* as is well seen in *H.* (*A.*) *angustifolia*, of the United States.

Hedyotis, Linn., proper, is well marked by its small, globular, hard and nut-like fruit, either indehiscent or tardily septicidal into closed cocci: and the seeds are peltate but not concave on the face; the corolla is short; the inflorescence axillary and glomerate; the stipules are mostly setose; and the leaves lineate-nervose.

Scleromitrion, equally Spermacoceous in aspect, differs from *Hedyotis* in having the fruit loculicidal across the summit, and the seeds of *Oldenlandia.*

Oldenlandia has a thin loculicidal capsule, with the very numerous and small seeds angular or globular, mostly obpyramidal or trihedral, not obcompressed nor hollowed on the face. *Karamyschewia* of Fischer and Meyer, from the Caucasian region, is an *Oldenlandia*, near *O. umbellata*, with two or more accessory calyx-teeth.

Kohautia, "too well marked in habit and character to be merged into *Hedyotis*," has the capsule and seeds of *Oldenlandia*, from which, irrespective of habit, it is distinguished only by the form of the corolla.

Houstonia, besides the (mostly) elongated corolla, is distinguished from *Oldenlandia* by the peltate seeds, hollowed or concave on their inner face. These are few or moderately numerous, — never very numerous, as in *Oldenlandia.* In *Euhoustonia* the seeds are deeply crateriform or thimble-shaped, and the globular-didymous pod is partly superior.*

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* EUHOUSTONIEÆ Americæ Borealis.

1. Capsula matura vix aut fere semisupera.

* Corollæ tubus calycem (sæpius longe) superans.

+ Semina globuloso-acetabuliformia, pl. m. scrobiculata, cavea hilari profunda sine crista mediana, ore rotundo.

++ Pedunculi plerique axillares, fructiferi nutantes.

H. ROTUNDIFOLIA, *Michx.* Seminum testa profundius scrobiculata.

++ ++ Pedunculi erecti filiformes. Semina subtiliter scrobiculata.

H. SERPYLLIFOLIA, *Michx.*

H. CÆRULEA, *Linn.*

The Indian *H. Rheedii* (*Hedyotis Rheedii*, Wight & Arn.) should probably be referred to *Euhoustonia*, notwithstanding the reduction of the ovules and seeds to a single pair. These closely resemble those of the typical *H. cærulea*. But *Hedyotis Wightiana*, Wall., associated with the former by Wight and Arnott, is truly a *Hedyotis;* the hard nucumentaceous fruit (in good Hookerian specimens) not being loculicidal at the summit, but splitting readily through the narrow partition into two closed, or at length ventrally dehiscent cocci, and the seeds are not meniscoidal, but flat-lenticular, as in genuine *Hedyotis*.

Although I have not seen the seeds, I have little hesitation in proposing to constitute a peculiar subgenus, *Macrohoustonia*, for two shrubby, large-flowered, Mexican species which Kunth referred to *Bouvardia*. This affinity in the case of one of them, *H. triflora*, has been noticed by Bentham; for his *Anotis longiflora*, Pl. Hartw. no. 206, is apparently *Bouvardia triflora*, H. B. K., the figure of which De Candolle has omitted to quote. The other, *H. longiflora*, is *Æginetia longiflora*, Cav., *Bouvardia longiflora*, H. B. K. Coulter's specimens (no. 215, from Real del Monte) want the fruit. But the seeds, as figured and described by Cavanilles, appear to resemble those of *H. rubra*, but with the thin margin more decidedly winged. Whether or not these plants

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+ + Semina depresso-acetabuliformia, lævia, intra caveam hilo lineari elevato notata, ore ovali: cæt. præcedentium.

H. PATENS, *Ell.* Hedyotis cærulea β. minor et H. minima, *Torr. & Gray, Fl.* 2, p. 38, pro parte.

* * Corollæ tubus lobos calycis amplos haud superans: pedunculi præcociores elongati, fructiferi patentes: semina fere *H. cæruleæ* sed majora.

H. MINIMA, *Beck.* Hedyotis minima, *Torr. & Gray,* l. c. pro parte, excl. char. Planta vernalis; caulibus demum ramosis 3-4-pollicaribus patentissimis; foliis scabris, imis ovatis vel spathulatis, superioribus oblongis sublinearibusve; corollæ lobis tubo æquilongis. Calycis lobi sesquilineales.

2. Capsula apice tantum libera: semina fere sect. 3: corolla parva: pedunculi fructiferi laterales patentissimi.

H. SUBVISCOSA. Oldenlandia subviscosa, *C. Wright, in Gray, Pl. Wright.* 2. p. 68, adn. Texas, *Wright, Berlandier*, coll. no. 991, 2421.

3. Capsulæ maturæ $\frac{2}{3}$ - $\frac{3}{4}$ superæ, e pedunculis brevissimis lateralibus recurvis pendulæ: semina lævissima, patenti-crateriformia, lateribus tenuibus quasi alatis, intus hilo lineari elevato notata.

H. HUMIFUSA. Hedyotis (Houstonia) humifusa, *Gray, Pl. Lindl.* 2. p. 216, & *Pl. Wright.* 1. p. 82. — Corolla breviuscula.

H. RUBRA, *Cav.* Corollæ tubo elongato-filiformia.

be admitted into *Houstonia*, they will hardly be left as congeners of *Bouvardia triphylla* or *Jacquini*.

Anotis, DC. will constitute the largest subgenus of *Houstonia*, including all of De Candolle's first and second sections, and of Arnott's third division of his subgenus of this name, except perhaps *Hedyotis monosperma;* and also two of De Candolle's three species of his genus *Rachicallis*. For his *R. nitida* and *R. Caracasana* are inseparable from his *Anotis setosa*, &c. The accessory calyx-teeth or interposed setæ are not constant nor of any consequence, (several *Houstoniæ* and *Hedyotideæ* vary in this way,) and the æstivation of the corolla is valvular, as in all true *Hedyoteæ*.* Not so, however, in *R. rupestris*, of the West Indies, the obvious type of *Rachicallis:* in this the lobes of the corolla are strongly imbricated, as in *Rondeletia*. The seeds of *Anotis* are meniscoidal, cymbiform, or at least concave on the inner face, and marked with a longitudinal hilar ridge: in some species they are undistinguishable from those of true *Houstonia*. If in others their margins are not inflexed so as to be distinctly concave on the inner face, they are never like those of *Oldenlandia*.

The nicer question remains as to what is to be done with sundry groups of Indian, Chinese, and Insular species, which stand between *Anotis* and true *Hedyotis*. I have examined a considerable number of them, but must refer the question to some botanist who can command fuller materials. As far as my examination extends, their seeds are all much alike, and are essentially those of *Hedyotis*, being compressed-lenticular and peltate, with a small, more or less protuberant hilum, not at all hollowed on the inner face, but with acute edges. The specimens I possess are reducible to two principal groups of species. First, those in which the summit of the capsule is more or less exserted beyond the calyx, and primarily loculicidal in dehiscence. In the remarkable *Hedyotis leptopetala*, Gray,† the pod and its dehiscence accord very well with those of American *Anotides*. In *H. scandens*, one of the types of *Dimetia*, and in *H. recurva*, Benth. (allied to *H. macrostema*, Hook. & Arn., the type of the section *Macrandria*, which I have not seen), the free summit is very soon septicidal also. These species, which may be taken to represent Wight and Arnott's *Dimetia* and *Macrandria*, accord far better in aspect and character with *Houstonia* (section *Anotis*) than with true *Hedyotis*, and would perhaps form a subgenus of the former, if not to be distinguished from both.

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* Wight and Arnott characterized their *Hedyotis* as having the lobes of the corolla "imbricated (not twisted) in æstivation." This obvious error has been copied all along by Endlicher, by Torrey and Gray, and recently by Miquel.

† Botany of Japan, in Mem. Amer. Acad. 6, p. 394. The patent fact has since arrested my attention, that this is the *Leptopetalum Mexicanum* of Hooker and Arnott, in the Botany of Beechey's Voyage, where there is a good figure; so that this belonged to that unfortunate parcel of specimens collected at the Loo Choo and Bonin Islands, but supposed to have come from Mexico.

On the other hand, all Wight and Arnott's species of their subgenus *Diplophragma*, having wholly inferior and purely septicidal-dicoccous fruit, adhere more naturally to *Hedyotis*. Their third division of this group appears strictly referable to that genus. Their remaining species may compose a subgenus of the same; but the dehiscence and the calyx, produced beyond the ovary into a merely 4-toothed or 4-cleft cup or limb, decidedly separate them from *Houstonia*. In the latter, the calyx is adnate up to the origin of the lobes. So it is in

Kadua, Cham. & Schlecht., a genus of more or less shrubby plants, natives of the Sandwich Islands, which was also reduced to the compound genus *Hedyotis* by Endlicher. Through the smaller and subherbaceous species, it does indeed nearly approach *Kohautia*. From this and from all the other related genera, *Kadua* may be technically distinguished by the somewhat salient or reduplicate edges of the lobes of the corolla in æstivation, and by the inflexion of their tips in all but two of the species, which again are well characterized by their winged seeds. The seeds, moreover, are compressed in *Kadua*, (not depressed or obcompressed,) packed side by side, and attached by one edge, not by one face. The capsule, also, is hard and firm, and tardily dehiscent, except by the transverse chink at its naked summit, in some species perhaps slightly drupaceous before maturity; which led the founders of the genus wrongly to refer hither two baccate species, then imperfectly known, — as has already been mentioned.

Meyen's genus *Weigmannia* is only *Kadua cordata;* and what is described and figured in the Reliquiæ Meyenianæ as a single large seed in each cell evidently consists of a mass of seeds closely packed upon the placenta.

The two wing-seeded species would fall into the subtribe *Cinchoneæ*, according to the prevalent arrangement, which also too widely separates *Bouvardia* from *Houstonia*, &c.; but there are other cases known in the family of winged and wingless seeds occurring in the same genus. *Rhombospora* of Korthals seems to be another Hedyotideous plant, referred to the *Cinchoneæ* upon this sole technical character. Indeed, even the whole distinction between baccate, drupaceous, and capsular fruits in the polyspermous *Rubiaceæ* is in many cases so indecisive, that in their classification it may answer better to proceed still farther in the direction already indicated by Mr. Bentham, and to take the primary characters from æstivation, placentation, and stipulation, rather than from the texture of the fruit and the surface of the seeds.

The following conspectus of the species of Kadua exhibits the diversities which this genus presents: —

KADUA, *Cham. & Schlecht.*

§ 1. Flores in cymam terminalem thyrsumve congesti: folia coriacea.

* Semina alata! Plantæ centranthoideæ, thyrsifloræ, subglaucæ, basi tantum frutescentes; foliis subsessilibus rigidis lineato-costatis; lobis calycis breviusculis; corollæ lobis æstivatione haud inflexis: capsula apice haud producto fere plana.

1. K. CENTRANTHOIDES, *Hook. & Arn.* Glaberrima: folia ovato-lanceolata seu cordata-ovata: stylus etiam glaber!

2. K. GLOMERATA, *Hook. & Arn.* Inflorescentia floresque pubescentes: folia caulina oblongo-lanceolata.

* * Semina complanata, scobiformia, nunc marginata vel subalata.

3. K. CORDATA, *Cham. & Schlecht.* Weigmannia glauca, *Meyen.* Habitus inter præcedentes et sequentes: folia superiora et floralia subcordata, ea cymulas glomeratas involucrantia: lobi calycis ovato-lanceolati ovario bis longiori, capsulam fere hemisphæricam vertice planiusculam excedentes.

* * * Semina immarginata, compresso-angulata: corollæ lobi in alabastro apice inflexi.

+ Caules suffrutescentes, 1 – 2-pedales; calyces majusculi. *Kohautiæ* affines.

4. K. COOKIANA, *Cham. & Schlecht.* Gracilis, juncoidea, pauciflora; foliis anguste lanceolatis linearibusve rigidis nervuloso-reticulatis; calycis lobis subulato-lanceolatis ovarium longe superantibus; capsulæ vertice libero conico.

5. K. PARVULA, *Gray, l. c.* Glaberrima; ramis gracilibus usque ad apicem foliosis; foliis coriaceis utrinque lucidulis conformibus (un-

ciam longis) ovato-lanceolatis acutis, inferioribus petiolatis summis sessilibus, venis primariis inconspicuis; floribus paucis (5 – 7) in cymula terminali; calycis lobis lato-lanceolatis tubo corollæ dimidio brevioribus capsula turbinata vertice subplana æquilongis.

6. K. GLAUCIFOLIA, *Gray, l. c.* Glaberrima; ramis usque ad cymam sessilem multifloram foliosis; foliis subcoriaceis ovato-lanceolatis imisve lanceolatis acute acuminatis breviter petiolatis (summis sessilibus) subtus glaucis penninervis; calycis lobis subulatis tubo corollæ gracilis multoties brevioribus capsula fere hemisphærica vertice convexiuscula paullo brevioribus.

+ + Frutex sat altus: calycis lobi ovario breviores e capsula vertice libero convexo vel conico demum decidui.

7. K. MENZIESIANA, *Cham. & Schlecht.* Hedyotis coriacea, *Smith.* H. conostyla, *Gaudich.* Kadua Smithii, *Hook. & Arn.*

§ 2. Flores axillares, imo supra-axillares: calycis lobi magni, solitarii bini vel terni: pedunculi filiformes, fructiferi nutantes: corolla viridula seu alba, limbo amplo, lobis acuminatis apicibus in alabastro inflexis: ovarium tetraquetrum: semina angulata: frutices foliosi: folia laxe penninervia sæpius membranacea.

8. K. ACUMINATA, *Cham. & Schlecht.* Glaberrima; ramis gracilibus; foliis lanceolatis sensim acuteque acuminatis breviter petiolatis, junioribus subsessilibus; calycis lobis anguste lanceolatis.

9. K. PETIOLATA, *Gray, l. c.* Ramosa, glabra; foliis oblongo-lanceolatis oblongisve subito acuteque acuminatis basi plerumque acutis longe petiolatis laxe venosis; calycis lobis lanceolatis seu triangulari-lanceolatis capsulam late turbinatam subæquantibus.

Var. OVALIFOLIA: major; foliis ovali-oblongis (3 – 4-pollicaribus), venis crassioribus.

10. K. GRANDIS, *Gray, l. c.* Foliis amplis oblongis ovalibusque breviter acuminatis perspicue penninerviis longiuscule petiolatis, junioribus ad costam venasque sæpius pubentibus; calycis lobis foliaceis ovato-lanceolatis capsula late turbinata acute 4-costata æquilongis; corollæ lobis tubum adæquantibus.

Species exclusæ: — *K. Romanzoffiensis,* Cham. & Schlecht. = *Gouldia Romanzoffiensis. K. affinis,* Cham. & Schlecht. = *Gouldia Sandwicensis.*

Professor Gray also presented the following communication: —

Notes upon some Polynesian Plants of the Order Loganiaceæ.

By Asa Gray, M. D.

These will naturally enough follow the foregoing notes upon *Rubiaceæ.*

1. *Geniostomeæ* (*Geniostoma* and *Labordea*).

Under the name of *Hæmospermum*, Reinwardt, Blume long ago correctly described the pulpy placentæ of *Geniostoma*, which enclose the seeds and fill the cells of the fruit. It is remarkable that this should have escaped the notice of succeeding authors, even of Alphonse De Candolle, when he reduced *Hæmospermum* to a species of *Geniostoma* upon the authority of an authentic specimen; and of Bentham, when he recently revised the *Loganiaceæ*,* and had Blume's detailed character of *Geniostoma* before him; † especially as in dried specimens the seeds all cohere in a mass, and are covered with a pellicle of dried pulp, which, when soaked, promptly swells up and encloses the seeds, just as they doubtless are enclosed in the fresh fruit. It appears from a supplementary note to Mr. Bentham's paper, that this structure has been noticed by M. Bureau, in his inaugural dissertation upon this group of plants (which I have not seen); but I do not well understand what is meant by "the curious expansions of the placenta" in a "regular stellately-lobed form." I am confident that there are no distinct *arilli* severally enclosing the seeds, in the manner of *Podophyllum*, but an equable pulpy development of the placenta. In this light it is questionable if Bentham's *G. fagræoides* (the flowers of which are unknown) is really a *Geniostoma*. Although the pericarp is capsular, the analogy of *Geniostoma* to *Gardenia* and the *Randieæ* in the placentation is not to be overlooked, especially as the æstivation of the corolla is similar. To this there are exceptions, however. Good as characters of æstivation are in *Rubiaceæ*, and as they are likely to be in these "*Rubiaceæ* with a free ovary," we can never trust implicitly to the difference between the imbricative and the contorted or convolute. No one can be more aware of this than Mr. Bentham, who will not be surprised to learn that this distinction between the second and third sections of his tribe *Euloganieæ* is untenable, — *Geniostoma rupestre* having occasionally the æstivation assigned to *Logania*, namely, with one lobe wholly exterior in the bud, while an unpublished Tahitian species exhibits, in the few flower-buds we have for examination, a regular quincuncial imbrication. That third section may, however, be confirmed by admitting the nature of the placentæ to a leading place in the character.

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* In Journal of the Proceedings of the Linnæan Society, Vol. I. 1857.

† In Mus. Bot. Lugd.-Bat., Vol. 1, p. 238, 1850.

The ovules of *Geniostoma* are amphitropous, as suggested by Endlicher, rather than anatropous, as stated by Blume; but the seeds become almost anatropous. The minute embryo assigned by Blume, and figured in his *G. lasiostemon,* is not borne out by *G. ligustrifolium* and *G. ruprestre,* both of which have the cylindrical embryo nearly as long as the albumen, as remarked by Alphonse De Candolle in the Mauritian *G. ovatum.*

The corolla, as remarked by Bentham, is not at all funnel-form, but almost rotate, — in fact, between rotate and campanulate. The phrase "*corolla subinfundibuliformis*" found its way into the generic character from Forster's figure of the flower of *G. rupestre,* which represents the tube of the corolla much too long. It is really so short that Sprengel, describing an original specimen, calls the corolla "*subrosacea pentapetaloidea.*" The fine pubescence on the lobes is variable in the same species, or even wanting. The villosity of the throat also varies in amount in different forms of *G. rupestre,* in some cases being reduced to a small tuft at the insertion of the short filaments, or merely upon them ; in one of our species it is wholly wanting.

The stigma, I believe, is capitate throughout the genus, or at first depressed-globose, after anthesis sometimes becoming obovate. Here, again, Forster's "*stigma cylindricum*" — utterly at variance with his figure, and that, in turn, doubtless incorrect as to the strong lobulation — has given rise, on the one hand, to De Candolle's "*stigma crassiusculum,*" on the other, to Endlicher's "*stigma sulcatum.*" Sprengel's "*stigma capitatum, pubescens, sublamellosum,*" is better, and would be better still without the last word. While occupied with the pistil of *G. rupestre,* I may remark that the difference between Forster's character "*stylus filiformis tubo longior*" and his figure (*d*), which exhibits a very short style (such as Sprengel terms "*brevissimus*"), is in fact exemplified in what I regard as different forms of this species ; — the style being often twice or thrice the length of the ovary and the stigma, and sometimes reduced in length even to a minimum. As to Sprengel's "*stylus basi villosus,*" that was probably suggested by Forster's figure; but that was intended to represent the whole pistil, and the villous hairs are placed, not upon the base of the style, but around the ovary, — indeed, they belong to the corolla.

The inflorescence is axillary throughout the genus. This is stated by Blume only; but De Candolle specifies the axillary flowers under almost every species.

The species of our Polynesian collections are evidently three, viz.: —

GENIOSTOMA LIGUSTRIFOLIUM, A. Cunn., of New Zealand, known by its didymous or bicapitate stigma, and its triangular pointed stipules.

GENIOSTOMA RUPESTRE, *Forst.;* a polymorphous species, to which I should refer, not only Blume's *G. Hæmospermum*, but probably Bentham's *G. crassifolium*, at least the variety *glaberrimum*, and even a plant which has the calyx assigned to *G. Cumingianum*, Benth. Our forms of the species — besides the typical one, which is smooth, and with rather small and pointed leaves, like those of the New Zealand species — may be arranged under the varieties *ellipticum*, *macrophyllum*, and *puberulum*. The species may be known from the last by the transversely truncate stipules, and the entire stigma, raised on more or less of a style, never absolutely sessile; nor is the corolla wholly glabrous within, as in

GENIOSTOMA ASTYLUM (*Gray, l. c.*): glaberrimum; stipulis truncato-bifidis; foliis ovalibus; sepalis ovatis; corolla intus glabro æstivatione quincunciali!; stigmate integro subgloboso sessili; fructu immaturo anguste oblongo. — Tahiti, Society Islands.

The specimen in the Hookerian herbarium from the Sandwich Islands referred by Bentham to his *G. crassifolium*, *β. glaberrimum*, if really from those islands, is likely to belong to a species which on the whole is better placed in the genus

Labordea. Judging from the plate in the Botany of Freycinet's Voyage, Bentham presumed the æstivation of the corolla of this imperfectly known genus to be valvular, and the fruit to be baccate. The first point would seem to have been verified by M. Bureau, who, according to Mr. Bentham's supplementary note, "has been enabled to dissect three flowers of this plant [*Labordea fagræoidea*, Gaudich.]. He confirms the presumed valvular æstivation of the corolla, but always finds two cells only to the ovary, and very plausibly suggests that the three-celled one examined by Gaudichaud was accidentally abnormal." Now, the herbarium of the South Pacific Exploring Expedition contains good flowering specimens of what I cannot doubt is Gaudichaud's *L. fagrœoidea* (notwithstanding two discrepancies in the details which are probably due to mistakes of the artist), and fruiting specimens of another and nearly related species, which negative both these presumptions, while they reveal the true affinity of the genus. That is to say, in our flowering plant the lobes of the corolla in æstivation decidedly, though narrowly, overlap in the convolute manner, and are slightly twisted towards the observer's left. Probably the flower-buds examined by Bureau were too young to show the æstivation properly. Also our fruiting plant is tricarpellary, in all the specimens we possess, and, which is of more consequence, the fruit is a capsule, just like that of *Geniostoma*, except in being trimerous, — the placentæ equally pulpy, and the seeds nidulant. *Labordea*, therefore, ranks next to *Geniostoma*, from which, so far as these materials show, it would seem to be very well distinguished by its Gærtneroid habit, the long and foliaceous divisions of the calyx, the tubular (instead of rotate-campanulate) corolla, the elongated club-shaped (instead of globose or didymous) stigma, and the terminal inflorescence. The occasional, if not the usual, tricarpellary ovary is at most a subsidiary distinction. It is not constant in *L. fagrœoidea*, and it can hardly be expected to be so in the allied species. But the same collection (and also Remy's, of later date) has supplied complete materials of a third species, which almost exactly fills the interval between these two genera. For, with the general habit and foliage, and the dicarpellary ovary of *Geniostoma*, it combines the hypocrateriform corolla, the clavate stigma, and the terminal inflorescence of *Labordea*. The form of the corolla, taken with that of the stigma, will surely outweigh that of the calyx, and the terminal inflorescence affords a better distinction than the occasionally trimerous gynæcium. So we must annex this ambiguous species to *Labordea*, unless we merge the latter genus in *Geniostoma*, which at present would hardly be warranted. The known species are: —

LABORDEA (GENIOSTOMOIDES) TINIFOLIA (*Gray, l. c.*): glaberrima; ramis gracilibus; foliis oblongis chartaceis longiuscule petiolatis; cyma pedunculata composita laxiflora; calycis segmentis triangulari-ovatis acutissimis tubo corollæ hypocraterimorphæ triplo brevioribus; stylo gracili; stigmate elongato-clavato; capsula globosa bivalvi. —

Sandwich Islands, in Kauai, Maui, Oahu, and Hawaii (coll. Expl. Exped., and coll. Remy).

LABORDEA FAGRÆOIDEA (Gaudich.): glabra, pallida; foliis obovato-oblongis oblongisve basi in petiolum breviusculum attenuatis penninerviis subcoriaceis; cyma sessili quasi umbellato-contracta; calyce amplo fere 5-secto, sepalis lanceolatis foliaceis nervosis corollæ tubum subæquantibus; stigmate elongato subclavato; ovario 2 – 3-loculari. — Our specimens are from Hawaii. On the same island was gathered an imperfect fruit-bearing specimen, possibly of this very species, but the vestiges of the calyx are much smaller, and the leaves are larger and somewhat pubescent. Of the fruit, I can only say that it is narrower than in the next, and bivalvular. Perhaps it is a distinct species, but the materials are insufficient.

LABORDEA SESSILIS (*Gray, l. c.*): foliis subsessilibus crasso-coriaceis lineato-venosis oblongis seu lanceolato-oblongis, junioribus subtus ramisque pube brevi fusca hirsutis; sepalis oblongo-lanceolatis; capsulis brevissime pedunculatis trivalvibus. — Oahu; in fruit only.

2. *Fagræa.* The two Polynesian species of this genus in the collection are interesting as offering additional points of similarity with *Lisianthus* and related *Gentianaceæ.* They are, *F. Berteriana,* Gray, which, with the corolla of *F. Zeylanica,* though smaller, (yet sometimes with the tube three inches long,) has the bilamellar stigma of *Lisianthus!* This is not mentioned in the character published in Bentham's revision of the genus. The other species, which is mentioned by Bentham, but not characterized, has the placentæ so strictly parietal and sessile, that they appear like four placentæ approximate in two pairs, after the manner of some *Gentianeæ* and *Orobancheæ.* It has no distinct stipules. It is as impossible, therefore, to draw a marked line of distinction between *Loganiaceæ* and *Gentianaceæ* on the one hand, as between them and *Rubiaceæ* on the other. So true is it, that *Loganiaceæ* are not so much an order *per se,* as a *nexus,* binding together four otherwise very distinct orders. — The new Feejean species may be thus characterized: —

FAGRÆA GRACILIPES (*Gray, l. c.*): foliis lato-ovatis subcoriaceis obtusis vel apiculato-acutis basi in petiolum longum abrupte decurrentibus; cyma terminali sessili multiflora foliis multo breviore; calyce parvo; corolla e tubo angusto superne late obconico-ampliata; staminibus subexsertis; stigmate capitellato; ovario prorsus uniloculari, placentis arcte parietalibus. — Feejee Islands.

3. Finally, there is a new Polynesian genus, doubtless Loganiaceous, although the corolla and consequently the stamens are unknown. It is remarkable for having an indehiscent, nucumentaceous, or possibly subdrupaceous, club-shaped fruit, on which account it does not fall into either of Bentham's four tribes. It is dedicated to Joseph P. Couthouy, Esq., the zealous Conchologist of the Expedition of which the plant is one of the fruits.

COUTHOVIA, Nov. Gen.

Calyx 5-partitus; segmentis rotundatis crassis imbricatis intus basi biglandulosis? Corolla et stamina ignota. Ovarium liberum, ovatum, calyce subinclusum, stigmate sessili apiculatum, biloculare. Ovula in placentis crassis, medio dissepimento adnatis, plurima, amphitropa. Fructus lignosus, maturus forte subdrupaceus, clavatus vel fusiformis, basi stipitiformi calyce parvo persistente stipata, bilocularis, indehiscens. Semina haud visa. — Frutex vel arbor Vitiensis, *Fagrœa* facie, stipulis vaginatis *Labordeœ;* cyma terminali; floribus parvis.

COUTHOVIA CORYNOCARPA (*Gray, l. c.*). — Ovolau and Sandal-wood Bay, Feejee Islands.

Four hundred and seventieth meeting.

October 11, 1859. — MONTHLY MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read several letters relative to the exchanges of the Academy.

Professor Felton presented, from the Hon. George P. Marsh, a circular letter in behalf of the new dictionary of the English Language undertaken by the Philological Society of London.

Professor Felton also exhibited a series of recent photographs from Athens, representing different views of the Parthenon, and some sculptures discovered upon the Acropolis in the course of excavations made during the present year.

Professor Lovering presented a memoir upon the Secular Periodicity of the Aurora Borealis; in which he referred to the manuscript records of the Academy as follows: —